



3-3-04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:

HACKL et al.

Serial No.: 10/713,640

Filed: November 13, 2003

Atty. File No.: 4764-32

For: "METHOD FOR THIOSULFATE  
LEACHING OF PRECIOUS METAL-  
CONTAINING MATERIALS"

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Group Art Unit: 1754

Examiner:

INFORMATION DISCLOSURE STATEMENT

"EXPRESS MAIL" MAILING LABEL NUMBER: EV368035615US  
DATE OF DEPOSIT: 3/1/04

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING  
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1450, ALEXANDRIA, VA 22313-1450.

TYPED OR PRINTED NAME: Amy S. Duarte

SIGNATURE: Amy S. Duarte

Dear Sir:

The references cited on attached Form PTO-1449 are being called to the attention of the Examiner.

☒ Copies of the cited non-patent and/or foreign references are enclosed herewith.

☒ Copies of the cited U.S. patents/patent application publications are not enclosed in

accordance with the waiver dated July 11, 2003, whereby patent applications filed after June 30, 2003 and international applications that have entered the national stage under 35 U.S.C. § 371 after June 30, 2003 need not submit copies of U.S. patents and U.S. patent application publications.

☐ Copies of the cited references are not enclosed, in accordance with 37 C.F.R. 1.98(d),

because the references were submitted to the U.S. Patent and Trademark Office in prior application Serial No. \_\_\_\_\_ filed \_\_\_\_\_, which is relied upon for an earlier filing date under 35 U.S.C. § 120.

☒ To the best of applicants' belief, the pertinence of the foreign-language references are

believed to be summarized in the attached English abstracts and in the figures, although applicants do not necessarily vouch for the accuracy of the translation.

☒ Examiner's attention is drawn to the following co-pending application:

Serial No. 10/446,548 filed May 27, 2003 (U.S. Pub. No. US 2004-0035252 A1)

☐ Other: \_\_\_\_\_

Submission of the above information is not intended as an admission that any item is citable under the statutes or rules to support a rejection, that any item disclosed represents analogous art, or that those skilled in

the art would refer to or recognize the pertinence of any reference without the benefit of hindsight, nor should an inference be drawn as to the pertinence of the references based on the order in which they are presented. Submission of this statement should not be taken as an indication that a search has been conducted, or that no better art exists.

It is respectfully requested that the cited information be expressly considered during the prosecution of this application and the references made of record therein.

### FEES

<input checked="" type="checkbox"/>	<p><b>37 CFR 1.97(b):</b> No fee is believed due in connection with this submission, because the information disclosure statement submitted herewith is satisfies one of the following conditions ("X" indicates satisfaction):</p> <p><input type="checkbox"/> Within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d), or</p> <p><input type="checkbox"/> Within three months of the date of entry into the national stage of an international application as set forth in 37 CFR 1.491 or</p> <p><input checked="" type="checkbox"/> Before the mailing date of a first Office Action on the merits, or</p> <p><input type="checkbox"/> Before the mailing of a first Office action after the filing of a request for continued examination under 37 CFR 1.114.</p> <p>Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.</p>
<input type="checkbox"/>	<p><b>37 CFR 1.97(c):</b> The information disclosure statement transmitted herewith is being filed after all the above conditions (37 CFR 1.97(b)), but before the mailing date of one of the following conditions:</p> <p>(1) a final action under 37 C.F.R. 1.113 or</p> <p>(2) a notice of allowance under 37 C.F.R. 1.311, or</p> <p>(3) an action that otherwise closes prosecution in the application.</p> <p>This Information Disclosure Statement is accompanied by:</p> <p><input type="checkbox"/> A Certification (below) as specified by 37 C.F.R. 1.97(e). Although no fee is believed due, if any fee is deemed due in connection with this submission, please charge such fee to Deposit Account 19-1970.</p> <p style="text-align: center;">OR</p> <p><input type="checkbox"/> A check in the amount of \$180.00 for the fee set forth in 37 C.F.R. 1.17(p) for submission of an information disclosure statement. Please credit any overpayment or charge any underpayment to Deposit Account No. 19-1970.</p>
<input type="checkbox"/>	<p><b>37 CFR 1.97(d):</b> This Information Disclosure Statement is being submitted after the period specified in 37 CFR 1.97(c).</p> <p><input type="checkbox"/> This information Disclosure Statement includes a Certification (below) as specified by 37 C.F.R. 1.97(e)</p> <p style="text-align: center;">AND</p> <p><input type="checkbox"/> Applicants hereby requests consideration of the reference(s) disclosed herein. Enclosed is the fee in the amount of \$180.00 under 37 C.F.R. 1.17(p). Please credit any overpayment or charge any underpayment to Deposit Account No. 19-1970. Election to pay the fee should not be taken as an indication that applicant(s) cannot execute a certification.</p>



**Certification (37 C.F.R. 1.97(e))**  
(Applicable only if checked)

☐ The undersigned certifies that:

☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(1).

☐ A copy of the communication from the foreign patent office is enclosed.

OR

☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than more than three months prior to the filing of this statement. 37 C.F.R. 1.97(e)(2).

Respectfully submitted,

SHERIDAN ROSS P.C.

By: *Douglas Swartz*

Douglas W. Swartz  
Registration No. 37,739  
1560 Broadway, Suite 1200  
Denver, Colorado 80202-5141  
(303) 863-9700

Date: March 1, 2004



FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE  INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	ATTY. DOCKET NO. 4764-32	SERIAL NO. 10/713,640
	APPLICANT HACKL et al.	
	FILING DATE November 13, 2003	GROUP ART

## U.S. PATENT DOCUMENTS

*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROP.
	1.	496,951	5/9/1893	Parkes			
	2.	1,627,582	05/10/27	Terry			
	3.	3,524,724	08/18/70	R.L. Every et al.	23	115	
	4.	3,902,896	09/02/75	Borbely et al.	75	109	
	5.	4,070,182	01/24/78	Genik-Sas-Berezowsky et al.	75	103	
	6.	4,269,622	05/26/81	Kerley, Jr.	75	103	
	7.	4,289,532	09/15/81	Matson et al.	75	105	
	8.	4,296,075	10/20/81	Yan	423	7	
	9.	4,304,644	12/08/81	Victorovich et al.	204	108	
	10.	4,369,061	01/18/83	Kerley et al.	75	103	
	11.	4,384,889	5/24/83	Wiewiorowski et al.	75	101	
	12.	4,489,984	12/25/84	Savins	299	5	
	13.	4,510,027	04/09/85	Wiewiorowski et al.	204	110	
	14.	4,552,589	11/12/85	Mason et al.	75	105	
	15.	4,571,264	02/18/86	Weir et al.	75	744	
	16.	4,585,561	04/29/86	Zlokarnik et al.	75	713	
	17.	4,605,439	08/12/86	Weir	75	744	
	18.	4,632,701	12/30/86	Genik-Sas-Berezowsky et al.	75	118	
	19.	4,634,187	01/06/87	Huff et al.	299	4	
	20.	4,654,078	03/31/87	Perez et al.	75	118	
	21.	4,654,079	03/31/87	Nunez et al.	423	29	

EXAMINER	DATE CONSIDERED
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

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	22.	4,723,998	02/09/88	O'Neil	75	101	
	23.	4,738,718	04/19/88	Bakshani et al.	75	105	
	24.	4,740,243	04/26/88	Krebs-Yuill et al.	75	101 R	
	25.	4,765,827	08/23/88	Clough et al.	75	2	
	26.	4,778,519	10/18/88	Pesic	75	118	
	27.	4,801,329	01/31/89	Clough et al.	75	97	
	28.	4,816,234	03/28/89	Brison et al.	423	29	
	29.	4,816,235	03/28/89	Pesic	423	32	
	30.	4,902,345	02/20/90	Ball et al.	75	118	
	31.	4,913,730	04/03/90	Deschenes et al.	75	370	
	32.	4,923,510	05/08/90	Ramadorai et al.	423	29	
	33.	4,925,485	05/15/90	Schulze	423	22	
	34.	5,071,477	12/10/91	Thomas et al.	75	744	
	35.	5,114,687	05/19/92	Han et al.	423	32	
	36.	5,127,942	07/07/92	Brierley et al.	75	743	
	37.	5,147,617	09/15/92	Touro et al.	423	27	
	38.	5,147,618	09/15/92	Touro et al.	423	27	
	39.	5,215,575	06/1/93	Butler	75	744	
	40.	5,236,492	08/17/93	Shaw et al.	75	744	
	41.	5,244,493	09/14/93	Brierley et al.	75	743	
	42.	5,308,381	5/3/1994	Han et al.	75	744	
	43.	5,338,338	08/19/97	Kohr	75	711	
	44.	5,354,359	10/11/94	Wan et al.	75	744	
	45.	5,364,453	11/15/94	Kohr	75	711	
	46.	5,405,430	04/11/95	Groves et al.	75	744	

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	47.	5,443,621	08/22/95	Kohr	75	711	
	48.	5,489,326	02/06/96	Thomas et al.	75	744	
	49.	5,536,297	07/16/96	Marchbank et al.	75	736	
	50.	5,536,480	07/16/96	Simmons	423	28	
	51.	5,626,647	05/06/97	Kohr	75	744	
	52.	5,785,736	07/28/98	Thomas et al.	75	736	
	53.	5,876,588	03/02/99	Lalancette et al.	205	560	
	54.	5,939,034	08/17/99	Virnig et al.	423	24	
	55.	6,197,214	03/06/01	Virnig et al.	252	184	
	56.	6,344,068	02/05/02	Fleming et al.	75	736	
	57.	6,451,275	09/17/02	Fleming	423	47	
	58.	2002-0092377 A1	07/18/02	Ji et al.	075	744	05/11/01
	59.	2004-0035252 A1	02/26/04	Ji et al.	075	722	05/27/03

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION	
							YES	NO
	60.	WO 91/11539	08/08/91	PCT	C22B	3/42	X	
	61.	WO 94/06944	03/31/94	PCT	C22B	11/04	X	
	62.	WO 95/04164	02/09/95	PCT	C22B	3/00	X	
	63.	WO 01/23626	04/05/01	PCT	C22B	3/42	X	
	64.	WO 01/42519	06/14/01	PCT	C22B	3/04	X	
	65.	WO 01/088212	11/22/01	PCT	C22B	11/00	X	

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66.	WO 02/27045 A1	04/04/02	PCT	C22B	3/02	X	
67.	EP 0 316 094 A2	05/17/89	EPO	C22B	11/04	X	
68.	EP 0 522 978 A1	01/13/93	EPO	C22B	3/18	X	
69.	AU 199918525 A1	09/16/99	Australia	C22B	003/02	X	
70.	AU 200131355 A1	10/11/01	Australia	B01J	039/04	X	
71.	AU 574818	06/05/86	Australia	C22B	011/04	X	
72.	JP 60208434	10/21/1985	Japan (Abstract Attached)	C22B	011/04		X
73.	JP 61127833	6/16/1986	Japan (Abstract Attached)	C22B	011/04		X
74.	JP 61127834	6/16/1984	Japan (Abstract Attached)	C22B	011/04		X
75.	RO 81261	2/1/1983	Romania (Abstract Only)	C22B	011/04		x
76.	ZA 770840	1/24/1978	South Africa			X	
77.	SU 1284942 A1	12/03/84	USSR (Abstract Attached)				X
78.	SU 1279954 A1	04/08/85	USSR (Abstract Attached)				X
79.	GB 1423342	02/04/76	United Kingdom	C08G	65/32	X	
80.	GB 2180829	4/8/1987	United Kingdom	C22B	11/04	X	
81.	GB 2310424	8/27/1997	United Kingdom	C22B	3/14	X	

## OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)

82.	ABBRUZZESE, C. et al.; "Thiosulphate Leaching for Gold Hydrometallurgy." <i>Hydrometallurgy</i> , Vol. 39 (1995), pp. 265-276.
83.	ABBRUZZESE, C. et al.; "Nuove Prospettive Per Il Recupero Dell'oro Dai Mineralia: La Lisciviazione Con Tiosolfata," <i>l'industria mineraria</i> , No. 4 (1994), pp. 10-14.
84.	ABLIMT, Ablet et al.; "Study on Intensified Leaching of Gold with Thiosulfate," <i>Xingjiang Res. Inst. of Chemistry; PRC</i> , Vol. 20 (1) (1999), pp. 39-41.
85.	AGADZHANYAN et al.; "Kinetics of Ion Exchange in Selective Systems. II. Kinetics of the Exchange of Differently charged Ions in a Macroporous ion Exchanger"; Published in the <i>Russian Journal of Physical Chemistry</i> ; 61(7); 1987; pps. 994-997.

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86.	ATLURI et al.; "Recovery of Silver from Ammoniacal Thiosulfate Solutions"; Published in Proceedings of a Symposium on Precious and Rare Metals held in Albuquerque, NM; April 6-8, 1988, pp. 290-305.
87.	ATLURI, Vasudeva Prasad; "Recovery of Gold and Silver from Ammoniacal Thiosulfate Solutions Containing Copper by Resin ion Exchange Method"; A Thesis Submitted to the Faculty of the Department of Materials Science and Engineering at the University of Arizona, 1987, 219 pages.
88.	ANZHANG, Mao et al.; "One-Step Leaching of Some Refractory Gold Concentrate Containing Arsenic and Theory Analysis," <u>J. Cent. South Univ. Technol.</u> , Vol. 4, No. 2 (Nov. 1997).
89.	AWADALLA, F.T. et al.; "Recovery of Gold from Thiourea, Thiocyanate, or Thiosulfate Solutions by Reduction-Precipitation with a Stabilized Form of Sodium Borohydride," <u>Separation Science and Technology</u> , Vol. 26, No. 9 (1991), pp. 1207-1228.
90.	AYLMORE et al., "Thermodynamic Analysis of Gold Leaching by Ammoniacal Thiosulfate Using Eh/pH Speciation Diagrams"; <u>Minerals &amp; Metallurgical Processing</u> , Vol. 8, No. 4, 11/ 2001; pp. 221-227.
91.	BAGDASARYAN, K.A.; "A Study of Gold and Silver..." <u>Izvestiia Vysshikh Uchebnykh Zavedenii Tsvetnaia Metallurgii</u> , Vol. 5, (1983), pp. 64-68.
92.	BALASANIAN, Ion et al.; "Modeling A Process for Sodium Thiosulfate Production from Sulfite and Sulfur," <u>Revista de Chimie</u> , Vol 26, No. 6 (1975), pp. 475-79.
93.	BARTELS, K.; "Chemical Abstract Index Compilation for Thiosalts and Related Compounds," CANMET Mineral Sciences Laboratories Report MRP/MSL 77-214 (TR) (Nov. 1978), pp. 1-5, A1-A17.
94.	BENEDETTI, Marc and Boulegue; "Mechanism of Gold Transfer and Deposition in a Supergene Environment," <u>Geochimica Et Cosmochimica Acta</u> , Vol. 55 (1991), pp. 1539-1547.
95.	BEREZOWSKY, R.M.G.S. et al.; "Recovery of Gold and Silver from Oxidation Leach Residues by Ammoniacal Thiosulphate Leaching," Paper presented at the 108 <sup>th</sup> AIME Annual Meeting, New Orleans, Louisiana, Feb. 18-22, 1979, pp. 1-18.
96.	BHADURI, Rahul S.; "Lixiviation of Refractory Ores with Diethylamine or Ammonium Thiosulfate," A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Metallurgical Engineering, August 1987, University of Nevada, Reno.
97.	BHAPPU, R.B.; "Status of Non-Cyanide Heap Leaching and Other Cyanide Substitutes," Session Papers: American Mining Congress, Vol. 1, April 24-28, 1988, Chicago, pp. 275-287.
98.	BLOCK-BOLTEN, Andrew et al.; "New Possibilities in the Extraction of Gold and Silver from Zinc and Lead Sulfide Flotation Wastes," TMS-AIME Fall Extractive Meeting, 1985, held in San Diego, CA; pp. 149-166.
99.	BLOCK-BOLTEN, Andrew et al.; "Gold and Silver Extraction from Complex Sulfide Wastes;" <u>Recycle and Secondary Recovery of Metals: Proceedings of the Int'l. Symposium on Recycle and Secondary Recovery of Metals and the Fall Extractive and Process Metallurgy Meeting</u> , 1985, pp. 715-726.
100.	BLOCK-BOLTEN, A. et al.; "Thiosulfate Leaching of Gold from Sulfide Wastes," <u>Metall.</u> , Vol. 40, No. 7 (Jul. 1986), pp. 687-689.
101.	BOURGE, Christian; "Thiosulfate may replace cyanide in leaching," <u>American Metal Market</u> , Vol. 107, No. 40 (Mar. 2, 1999), p. 6.

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102.	BREUER, P.L. et al.; "Thiosulfate Leaching Kinetics of Gold in the Presence of Copper and Ammonia," <u>Minerals Engineering</u> , Vol. 15, No. 10-11 (2000), pp. 1071-1081.
103.	BREUER, P.L. et al.; "Fundamental Aspects of the Gold Thiosulfate Leaching Process," presented at TMS Meeting, February 2001.
104.	BREUER, Paul et al.; "An Electrochemical Study of Gold Oxidation in Solutions Containing Thiosulfate, Ammonia and Copper," Department of Chemical Engineering, Monash University, Australia.
105.	BRIONES, R. et al.; "The Leaching of Silver Sulfide with the Thiosulfate-Ammonia-Cupric Ion System," <u>Hydrometallurgy</u> , Vol 20 (1998), pp. 243-260.
106.	BYERLEY, J.J. et al.; "The Oxidation of Thiosulfate in Aqueous Ammonia by Copper (II) Oxygen Complexes," <u>Inorg. Nucl. Chem. Letters</u> , Vol. 9 (1973), pp. 879-883.
107.	BYERLEY, John J. et al.; "Kinetics and Mechanism of the Oxidation of Thiosulphate Ions by Copper - (ii) Ions in Aqueous Ammonia Solution," (1973), pp. 889-894.
108.	BYERLEY, John J. et al.; "Activation of Copper (II) Ammine Complexes by Molecular Oxygen for the Oxidation of Thiosulfate Ions," <u>Journal of Chemical Society: Dalton Transactions</u> (1975), pp. 1329-1338.
109.	CALISTRU, C. et al.; "Modelling of the Production of Sodium Thiosulfate From Sulfite and Sulfur," <u>Revista de Chimie</u> , Vol. 25, No. 3 (1974), pp. 197-200.
110.	CANEY, D.J.; "Thiosulfate shows leach promise - U.S. government study shows costs about the same as cyanide," <u>American Metal Market</u> , Vol. 102, No. 196 (Oct. 11, 1994), p. 7.
111.	CAO, Changlin et al.; "Leaching Gold by Low Concentration Thiosulfate Solution," <u>Transactions of NFsoc</u> , Vol. 2, No. 4 (Nov. 1992), pp. 21-25
112.	CHANDA, M. et al.; "Ion-Exchange Sorption of Thiosulfate and Tetrathionate on Protonated Poly (4-Vinyl Pyridine)," <u>Reactive Polymers</u> , Vol. 2 (1984), pp. 269-278.
113.	CHEN, Jin et al.; "Electrochemistry of Gold Leaching with Thiosulfate (I) Behaviour and Mechanism of Anodic Dissolution of Gold," <u>J. Cent. South Inst. Min. Metall.</u> , Vol. 24, No. 1 (April 1993) (Published in Chinese), pp. 169-173.
114.	CHEN, Yougang et al.; "Production of Sodium Thiosulfate From Reduced Waste Liquor Containing Sodium Sulfide," <u>Chemical World</u> , Vol 31, No. 3 (1990), pp. 130-32.
115.	COSANO, J.S. et al.; "Methods for Online Monitoring to be Implemented in an Ammonium Thiosulfate Production Plant," <u>Analytica Chimica Acta</u> , Vol 308, No. 1-3 (1995), pp. 187-96.
116.	DANEHY, James P. et al.; "Iodometric Method for the Determination of Dithionite, Bisulfite, and Thiosulfate in the Presence of Each Other and Its Use in Following the Decomposition of Aqueous Solutions of Sodium Dithionite," <u>Analytical Chemistry</u> , Vol 46, No. 3 (1974), pp. 391-95.
117.	DAS, Tomi Nath et al.; "Reduction Potentials of SO <sub>3</sub> .Bul-, SO <sub>5</sub> .Bul-, and S <sub>4</sub> O <sub>6</sub> .Bul.3- Radicals in Aqueous Solution," <u>The Journal of Physical Chemistry</u> , Vol 103, No. 18 (1999), pp. 3581-88.

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118.	de JONG, Govardus A.H. et al.; "Polythionate Degradation by tetrathionate hydrolase of <i>Thiobacillus ferrooxidans</i> ," <u>Microbiology</u> , Vol. 143 (1997), pp. 499-504.
119.	DELIANG, Li et al.; "Studies on a United Non-Toxic Process to Recover Au/Cu from Complex Gold Ores Bearing Copper," <u>Journal of Xiangtan Mining Institute</u> , Vol. 14, No. 2 (1999), pp. 50-54.
120.	DHAWALE, S.W.; "Thiosulfate: An Interesting Sulfur Oxoanion That Is Useful in Both Medicine and Industry—But Is Implicated in Corrosion," <u>Journal of Chemical Education</u> , Vol. 70, No. 1 (Jan. 1993), pp. 12-14.
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